

CLAIMS

What is claimed is:

1. A method for providing a ground strap on a semiconductor device comprising the steps of:
 - (a) providing a substrate region;
 - (b) providing an epitaxial (EPI) layer over the substrate region;
 - (c) etching a plurality of device structures in the EPI layer;
 - (d) providing a slot in the semiconductor substrate that is in contact with the substrate region;
 - (e) oxidizing the slot except at the bottom of the slot; and
 - (f) providing a metal within the slot.
2. The method of claim 1 wherein the metal providing step (f) comprises the step of:
 - (f1) filling the slot utilizing a metal that is provided on the surface of the EPI layer that is of a thickness that is one-half the depth or width of the at least one slot.
3. The method of claim 1 wherein the metal comprises a plurality of metals.
4. The method of claim 3 wherein the plurality of metals comprises two metals, a first metal covers one half the slot depth and a second meal fills the slot.

1 5. The method of claim 4 wherein the plurality of metals comprises three deposited
2 metals, wherein the first and second metal fill the slot, followed by a deposited dielectric,
3 wherein contacts are opened, including those to the second deposited metal and the third metal
4 provides an interconnect layer and contacting metal.

1 6. The method of claim 1 wherein the at least one metal is provided utilizing
2 chemical vapor deposition.

1 7. The method of claim 1 wherein the metal is provided utilizing sputter
2 deposition.

1 8. The method of claim 1 wherein the ground strap comprises an ideal short to
2 ground.

1 9. The method of claim 1 wherein the ground strap provides for isolation between
2 components by means of the oxide that is in the slots except the bottom of the slots where the
3 ground strap makes contact to the ground.

1 10. A semiconductor device comprising:
2 a semiconductor substrate, the semiconductor substrate including a plurality of
3 device structures thereon; and
4 an interconnect on the semiconductor substrate, the interconnect comprising at
5 least one slot provided in the semiconductor substrate and at least one metal within the slot,

6 wherein the at least one slot is oxidized everywhere except at the bottom of the slot where the
7 interconnect forms a ground.

1 11. The semiconductor device of claim 10 wherein the metal comprises a plurality
2 of metals.

1 12. The semiconductor device of claim 11 wherein the plurality of metals comprises
2 two metals, a first metal covers one-half of the slot and a second metal fills the slot.

1 13. The semiconductor device of claim 12 wherein the plurality of metals comprises
2 three metals, wherein the first and second metals fill the slot and the third metal provides an
3 interconnect layer.

1 14. The semiconductor device of claim 13 wherein the ground strap comprises an
2 ideal short to ground.

1 15. The semiconductor device of claim 14 wherein the ground strap provides for
2 isolation between components.

1 16. A high voltage interconnect on a semiconductor substrate comprising:
2 at least one slot provided in the semiconductor substrate; and
3 at least one metal within the slot, wherein the at least one slot is oxidized
4 everywhere except at the bottom of the slot, and the interconnect forms a very low resistance

5 ground strap.

1 17. The interconnect of claim 16 wherein the metal comprises a plurality of metals.

1 18. The interconnect of claim 17 wherein the plurality of metals comprises two
2 metals, a first metal covers one-half of the slot and a second metal fills the slot.

1 19. The interconnect of claim 16 wherein the plurality of metals comprises three
2 metals, wherein the first and second metals fill the slot and the third metal provides an
3 interconnect layer.

1 20. The interconnect of claim 16 wherein the ground strap comprises an ideal short
2 to ground.

1 21. The interconnect of claim 16 wherein the ground strap provides for isolation
2 between components.